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EXAMINER	
VAN OUDENAREN, SARAH A	
ART UNIT	PAPER NUMBER
1793	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/583,010	SIJPKES ET AL.	
	Examiner	Art Unit	
	SARAH VAN OUDENAREN	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 October 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 7-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 7-12 provides for the use of a catalyst, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claims 7-12 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd.* v. *Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

> the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 6-8, and 10-11 are rejected under 35 U.S.C. 103(a) as being obvious over Satoru et al (EP 0 895 809) in view of Shaw et al (US 4,280,929).

Satoru teaches a Nb containing catalyst which can be used for the production of (meth)acrylic acid or (meth)acrylonitrile in high yield. The active elements of the catalyst are Nb, Mo, V, and Te (pg 6, lines15-20). The catalyst may further comprise a carrier which may be silica, alumina, titania, magnesia, or zirconia (pg 13, lines 5-15). An aqueous compound mixture is made with Nb and solutions of the other active elements and can have the carrier as well. It is usually obtained in the form of a slurry. The aqueous mixture is then spray dried at a temperature of 150-300°C. (pg 13, lines 30-58). The dried particulate catalyst can be heat treated in an atmosphere of air at a temperature of 200-400°C and then calcined in an atmosphere of inert gas at a temperature of 500-700°C (pg 14, lines 1-15).

Satoru does not explicitly teach the use of a ceramic in the form of a powder as the carrier.

Shaw teaches a multi-component oxide catalyst known to be useful in the oxidation of olefins to oxygenated hydrocarbons. Examples of these reactions are the oxidation of isobutylene to methacrolein (col 1, lines 5-15). Shaw teaches that it has been discovered the use of fumed silica in catalyst preparation followed by an addition of silica results in a catalyst having better physical strength for operation and greater activity and selectivity than the prior art supported catalyst (col 1, lines 40-45). Shaw identified prior art carriers to be silica sol (col 1, lines 30-35). Shaw further teaches

fumed silica should be well mixed with the active components in a slurry before drying and the fumed silica should be 5-95% of the total silica used (col 2, lines 40-50).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the fumed silica of Shaw with the catalyst of Satoru as the addition of the fumed silica would produce a catalyst with better physical strength for operation and greater activity and selectivity.

Regarding claim 2, Satoru teaches the aqueous mixture being spray dried at a temperature of 150-300°C (pg 13, lines 50-55).

Regarding claim 3, Satoru teaches the calcining taking place in an inert atmosphere where the inert gas is nitrogen or argon (pg 14, lines 1-5).

Regarding claim 6, Satoru's method obtains a catalyst which has active ingredients of Nb, Mo, V, and Te (pg 12, lines 45-55).

Regarding claims 7-8, Satoru teaches (meth)acrylic acid of (meth)acrylonitrile can be produced via oxidation or ammoxidation of propane or isobutene in the presence of the catalyst discussed above (pg 14, lines 5-10).

Regarding claims 10-11, Satoru teaches the process can be conducted in a conventional reactor such as a fixed bed reactor (pg 14, lines 10-15).

Claim 4 is rejected under 35 U.S.C. 103(a) as being obvious over Satoru et al (EP 0 895 809) in view of Shaw et al (US 4,280,929) and further as evidenced by Wypych (Handbook of Fillers, 2nd edition, 2000).

Satoru teaches a Nb containing catalyst which can be used for the production of (meth)acrylic acid or (meth)acrylonitrile in high yield. The active elements of the catalyst are Nb, Mo, V, and Te (pg 6, lines15-20) as discussed above. Satoru does not explicitly teach the use of a powder as the carrier. It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the fumed silica of Shaw with the catalyst of Satoru as the addition of the fumed silica would produce a catalyst with better physical strength for operation and greater activity and selectivity, as discussed above.

Satoru nor Shaw explicitly teach the particle size of the carrier. As discussed above, the carrier is substantially fumed silica. Fumed silica has a particle size of 5-40nm as evidenced by Wypych (Section 2.1.51.1 pg 132).

Claims 9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoru et al (EP 0 895 809) as modified by Shaw et al (US 4,280,929) as applied to claims 1 and 6 above, and further in view of Ushikubo (US 5,380,933).

Satoru teaches a Nb containing catalyst which can be used for the production of (meth)acrylic acid or (meth)acrylonitrile in high yield. The active elements of the catalyst are Nb, Mo, V, and Te (pg 6, lines15-20) as discussed above. Satoru does not explicitly teach the use of a powder as the carrier. It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the fumed silica of Shaw with the catalyst of Satoru as the addition of the fumed silica would produce a catalyst with better physical strength for operation and greater activity and selectivity.

Satoru does not explicitly teach the preparation of acetic acid by oxidizing ethane.

Ushikubo teaches a method for producing carboxylic acid which subjects an alkane to a vapor phase catalytic oxidation reaction in the presence of a catalyst comprising Mo, V, Te, and Nb (col 1, lines 60-70). The starting material alkane may be ethane (col 5, lines25-35).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the catalyst of Satoru with the ethane and production of carboxylic acid of Ushikubo as the catalysts utilized are similar and would therefore produce similar products when put under oxidation. Further, as both Ushikubo and Satoru teach oxidizing an alkane with their respective catalysts, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize any alkane, i.e. ethane.

Regarding claim 12, Satoru teaches the process can be conducted in a conventional reactor such as a fixed bed reactor (pg 14, lines 10-15).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Satoru et al (EP 0 895 809) as modified by Shaw et al (US 4,280,929) as applied to claims 1 and 6 above, and further in view of Han et al (EP 1 358 932).

Satoru teaches a Nb containing catalyst which can be used for the production of (meth)acrylic acid or (meth)acrylonitrile in high yield. The active elements of the catalyst are Nb, Mo, V, and Te (pg 6, lines15-20) as discussed above. Satoru does not explicitly teach the use of a powder as the carrier. It would have been obvious to one of ordinary

skill in the art at the time of the invention to utilize the fumed silica of Shaw with the catalyst of Satoru as the addition of the fumed silica would produce a catalyst with better physical strength for operation and greater activity and selectivity.

Han teaches a supported catalyst comprising mixed metal oxide. The catalyst comprises Mo, V, Te, and Nb and can be combined with a support (pg 4, lines 45-58) as discussed above. Han further teaches that the material may be converted to a catalyst having higher activities by grinding and then processing it (pg 7, lines 45-50). Han teaches the particle size of the catalyst to be 5-30 mesh (pg 5, lines 1-10).

It would have been obvious to one of ordinary skill in the art at the time of the invention to grind the catalyst of Satoru in view of Shaw as taught by Han further as it would convert the catalyst to have higher activity. Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to further grind the catalyst into an optimal size for the desired end product and/or to be functional during the desired reactive conditions.

Response to Arguments

Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

The amendment to claim 1 has overcome the previously set forth 112 2nd paragraph rejection over claim 4 regarding antecedent basis. The 112 2nd paragraph and 101 rejection over claims 7-12 is maintained as the presently amended claims do not positively recite a method/process step. The "utilization" of the previously claimed

catalyst is not considered a definite recitation of any steps involved in the process and therefore results in an improper definition of a process.

The 102(b) rejection over Satoru has been overcome, however a new 103(a) rejection over Satoru in view of Shaw has been set forth above, as well as Satoru in view of Shaw as evidenced by Wypych, and Satoru in view of Shaw further modified by Ushikubo and an additional rejection as further modified by Han. The 102(a) rejection over Han has been overcome.

Regarding Satoru, applicant argues that Satoru fails to disclose the use of an inert carrier in the form of a powder. Examiner disagrees as Satoru teaches a carrier which may be silica, alumina, titania, magnesia, or zirconia-- all of which are taught by applicant to be ceramic inert carriers (applicant's own pg 3). While it is noted that Satoru teaches it is preferable to utilize silica sol, this is considered by examiner to be a preference and by no means a declaration by Satoru that no other carrier previously mentioned may be used. Also, it is noted that a silica sol is still considered by examiner to constitute an inert carrier in the form of a powder as a silica sol contains powder particles. The claim language does not represent a requirement for the carrier to be in the form of a "dry" powder. As it is understood that applicant has defined "ceramic form" to refer to a dry powder form (applicant's pg 2), such language has not been recited in the claims and therefore the powder of the instant claims is not considered to be dry. Similarly, the language “inert carrier in ceramic form” as defined by applicant (pg 2) is also not reflected in the claim language. However, examiner has entered a new 103(a)

rejection of Satoru in view of Shaw in which Shaw explicitly teaches the benefit of fumed silica as a carrier which is considered a dry powder.

Regarding Ushikubo, applicant argues that Ushikubo fails to teach the use of a catalyst supported on an inert carrier in the form of a ceramic carrier powder. Examiner disagrees as Ushikubo teaches a the catalyst can be used with a suitable carrier such as silica, alumina, titania, or zirconia (col 4, lines 45-50). This is considered by examiner to be a ceramic inert carrier in powder form.

Regarding Han in reference to claim 5, applicant argues that Han is combined with a ceramic carrier not provided on a ceramic carrier. Han is currently relied upon only for the teaching of converting a catalyst having higher activities by grinding and then processing it. Further, it is noted above in the rejection over claim 5, it would have been obvious to one of ordinary skill in the art at the time of the invention to further grind the catalyst into an optimal size for the desired end product and/or to be functional during the desired reactive conditions.

Regarding the evidence submitted with applicant's arguments, such evidence should be submitted in the form of an affidavit or declaration. Examiner considers the evidence submitted not commensurate with the scope of the instant claims as the instant claims are not limited to silica, but rather recite ceramic. It is unclear to examiner how the evidence comparing dry silica powder and silica sol measures in reference to the broader ceramic which is instantly claimed. Further, Satoru only discusses silica sol as being preferential form for silica and teaches several other ceramic carriers which are also taught by applicant to be considered inert ceramic carriers. Still further, silica

sol can still be considered by examiner to read on the instant claim as silica sol is considered an inert ceramic carrier in “the form of a powder” as claimed as such a sol contains powder particles. However, a new rejection over Satoru in view of Shaw is entered above in which it is seen that a more desired result is obtained when dry powder silica (fumed silica) is also used to form the carrier. Also Shaw teaches that using fumed silica in catalyst preparation followed by an addition of silica results in a catalyst having better physical strength for operation and greater activity and selectivity than the prior art supported catalyst, thus it Is expected that the use of a dry powder such as fumed silica would provide higher catalyst activity and selectivity.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Grasselli et al (US 4,377,500) teaches a catalyst formed by a single slurry technique using a silica sol and fumed silica as the catalyst support (see abstract). Hensel et al (US 3,773,692)teaches a catalyst for the oxidation of acrolein to acrylic acid wherein suitable carrier substances are aluminum oxide and silicon dioxide. Hensel further teaches the activity of the catalyst can be controlled by varying the weight ratio of the catalyst to the carrier and especially varying the ratio of carrier components with a large and small surface are (col 2, lines 20-50).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SARAH VAN OUDENAREN whose telephone number is

(571)270-5838. The examiner can normally be reached on Monday-Thursday, 9:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin Curtis Mayes can be reached on 571-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SARAH VAN OUDENAREN/
Examiner, Art Unit 1793
January 11, 2010

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793